

**The Knowledge Bank at The Ohio State University**  
**Ohio State Engineer**

**Title:** Back Matter

**Issue Date:** May-1924

**Publisher:** Ohio State University, College of Engineering

**Citation:** Ohio State Engineer, vol. 7, no. 4 (May, 1924), 29-36.

**URI:** <http://hdl.handle.net/1811/33644>

**Appears in Collections:** [Ohio State Engineer: Volume 7, no. 4 \(May, 1924\)](#)

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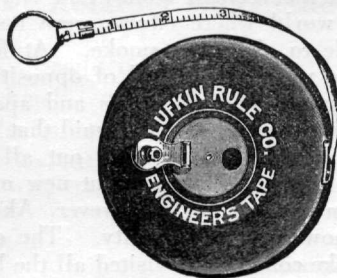
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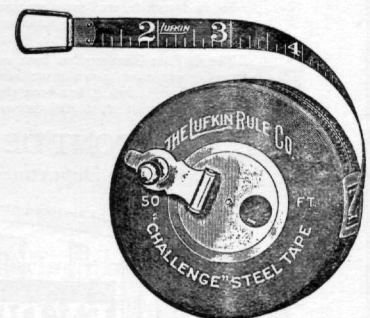
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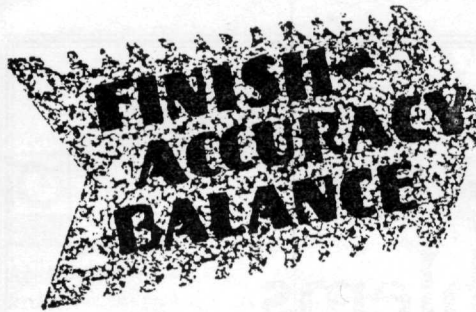
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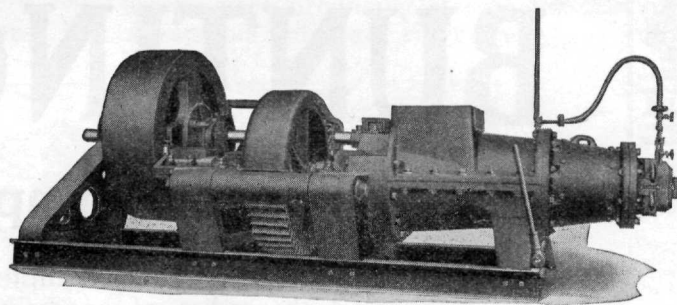
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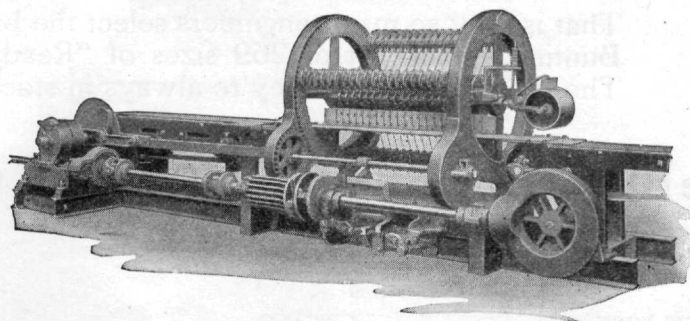
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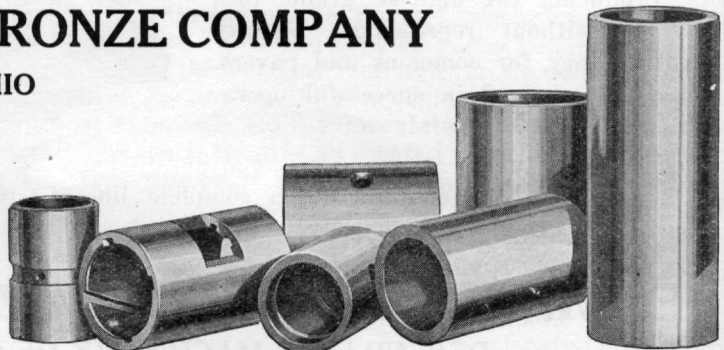
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Units produced by The Hadfield—Penfield Steel Co., of Bucyrus, O., are so built and include—

### ***Diesel Engines***

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### ***Crawler Tracks for Fordsons***

### ***Manganese Steel—"ERA" Brand***

**DIESEL ENGINES**—Product as much power on one car of oil as can be developed from ten cars of coal under boilers. No shoveling of coal or ashes. One-tenth freight. Cost starts when work starts.

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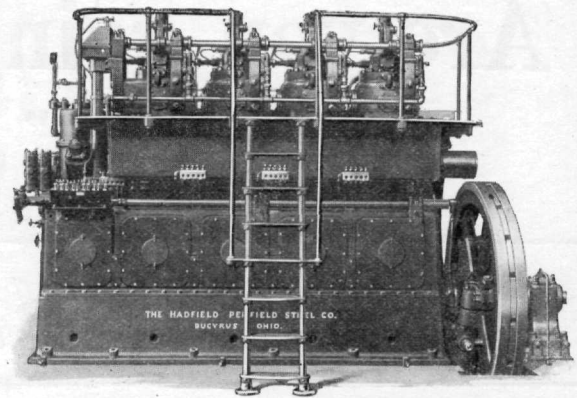
**CRAWLER TRACKS**—Make a Crawler of any Fordson. Doubles its pulling power. Goes anywhere. Ford service and low upkeep.

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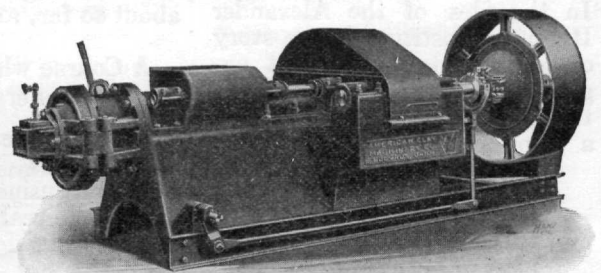
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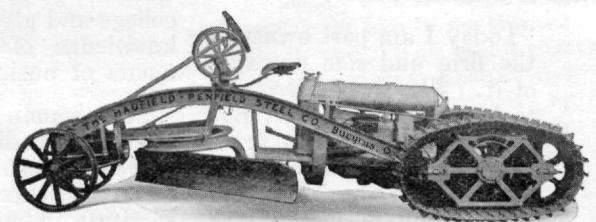
200 Horse Power Diesel Engine



Gasoline Locomotive



No. 290 Auger Brick Machine



One Man Grader and Crawler Tracks for Fordson  
Can be used Separately or Together



# Are you going to be a "drop-forged" engineer?

*There are thousands of that kind and, soon or late, they learn with a shock that they can get just about so far, and no further*

**THREE** big eastern university engineering societies held a joint meeting recently. They were alumni men of technical colleges. And they met to discuss the outlook of the college trained engineer.

"The trouble," said a speaker, "is that too many of us are 'drop-forged' engineers. We know our profession; but of Business, to which it is so closely related—we just don't know what it's all about."

In the files of the Alexander Hamilton Institute is the story of a graduate of a great engineering college. With all his training and his degree, he was a "drop-forged" engineer.

"When I left college I did not know the A B C of how to consider even the simplest of business problems," he wrote.

Upon leaving college, he started to work as an engineer for a big technical firm at \$70 a month. He is still with that firm. And this is what he writes:

"Today I am part owner of the firm and sole manager of it. *This hasn't been due to luck by any means; but simply by putting into practice what anyone can get from the Modern Business Course and Service of the*

Alexander Hamilton Institute."

## It is not enough to know the technical side alone

The director of a western engineering college said recently: "The most dominant characteristic of the engineering profession is the preponderance of the commercial over the technical."

Step by step, the engineering enterprises that achieve big success, and make careers for engineers, are guided by the same fundamental laws and practices that rule modern business. And thousands of engineers have learned by bitter experience that without business training, technical training carries a man just about so far, and no farther.

## A Course whose product is understanding

The Alexander Hamilton Institute was founded by a group of business men and educators who realized that modern business was developing specialists, but not executives; that somehow more men must be taught the fundamentals that underlie the operations of every department of business.

The Institute has only one Course. It takes a man out of college and gives him a working knowledge of all the departments of business.

Such a man receives in a few months of reading what ordinarily would consume years of practical experience. He finds in the Institute a more direct path

from where he is to where he wants to be. He has the satisfaction of carrying large responsibilities while he is still young. Naturally and inevitably he earns more than the average man of the same years and education.

For the "drop-forged" engineer who asks himself "Where am I going to be five years from now?" the Alexander Hamilton Institute has an encouraging story to tell. It is the story of the thousands of successful college men—many of them engineers—who have saved the wasted years; men who, thru the Course and Service, have added to their technical equipment the training which makes them understand what business is all about.

## "Forging Ahead in Business"

"Forging Ahead in Business" is a 116-page book especially prepared for men who are taking stock of their prospects and wondering what the future may hold for them. It is not a book for idlers, or men of feeble purpose. But to men who seriously want to know what the Course has done for others in positions like their own, the book will be a revelation. It will be sent without obligation. Just send the coupon below.

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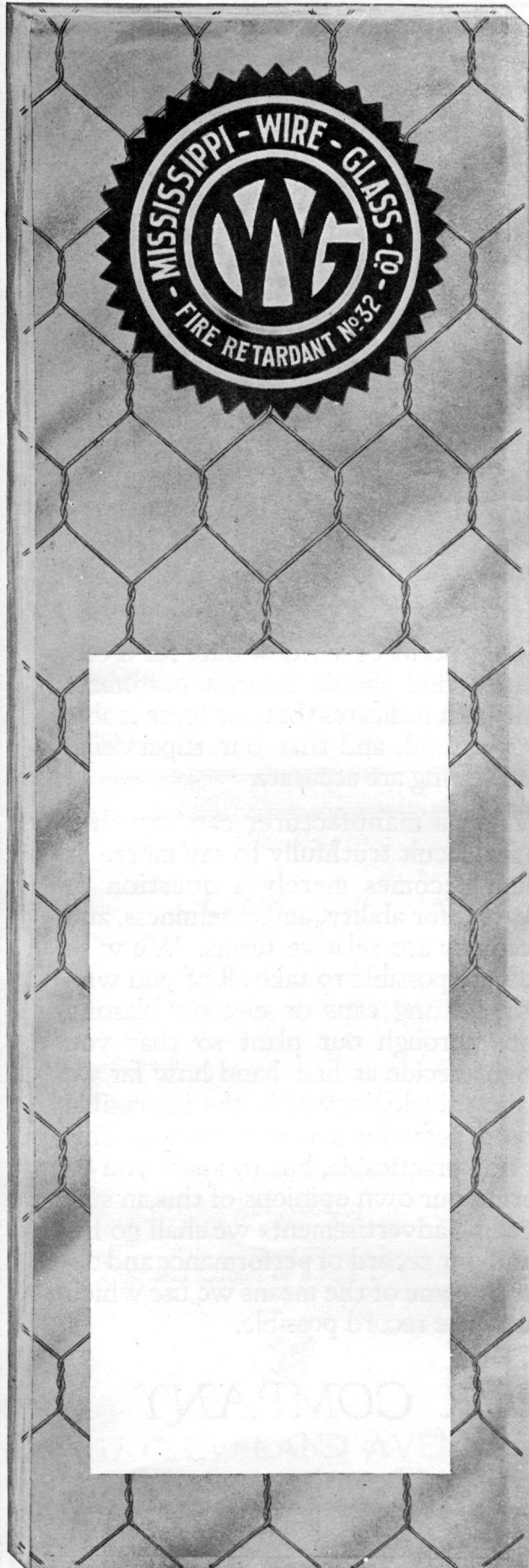
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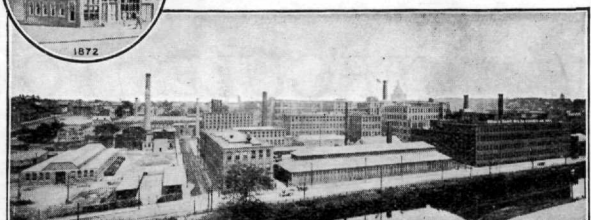
Milling Machines  
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Gear Cutting Machines  
Screw Machines

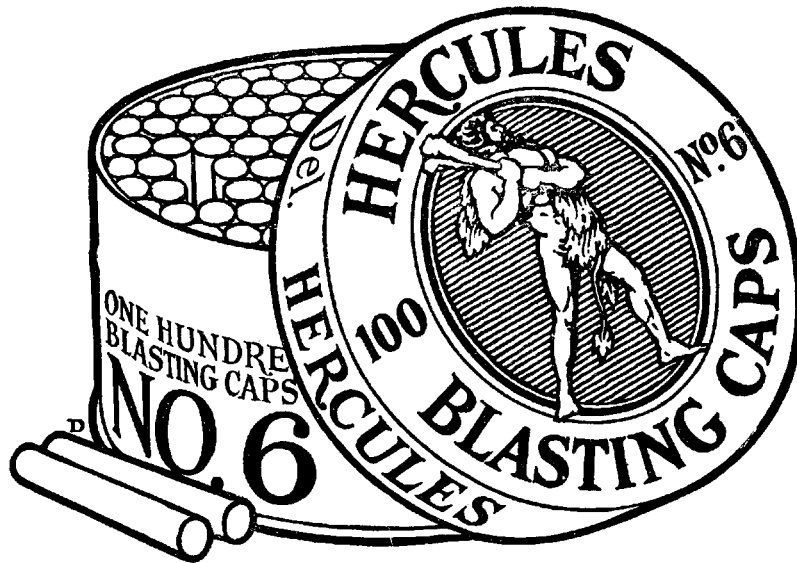
Knowledge of our line of manufacture will surely be of use to you in years to come—for Brown & Sharpe Machines are used in a great many industries. In the small repair shop or in the largest high production manufacturing plant, these machines are being used to do many classes of work. The small shop likes their versatility and ability to stand up under that extraordinary job which often loads the machine beyond its rated capacity. The big plant finds they give production and a product uniformly accurate. Brown & Sharpe Machines are ruggedly constructed and will maintain their accuracy for many years. Investigate their many uses.



Ask your Librarian to show you the Brown & Sharpe books — Catalogue studies—Nos. 29, 29x and 29xx. Our Catalogue No. 137 gives details about our entire line of manufacture.

**BROWN & SHARPE MFG. CO.**  
Providence, R. I., U. S. A.





## To Help You to Decide

THE manufacture of 100,000,000 blasting caps without a complaint, and 20,000,000 electric blasting caps with only one valid complaint involving a small number, is the present record of our Port Ewen plant. It is a record of which we are not ashamed, and which we are naturally striving to maintain; but after all, the record itself is not the important thing to our customers.

In any process which involves the human factor largely, as does the manufacture, inspection, and testing of blasting caps, perfection is unattainable. The nearness to which it can be approached depends upon the skill and conscientiousness of the workers; and upon the vigilance with which checks are applied by persons, themselves liable to error, upon the performance of others subject to the same liability. This prac-

tically perfect record of ours for a certain period should interest customers only as it indicates that our force is able and careful, and that our supervising and testing are accurate.

When a manufacturer can say this, it is difficult truthfully to say more. It then becomes merely a question of degree; for ability, and carefulness, and accuracy are relative terms. We wish it were possible to take all of you who use blasting caps or electric blasting caps through our plant so that you might decide at first hand how far we have traveled towards the impossible goal of perfection in manufacturing. This is not practicable, but to assist you to form your own opinions of this, in succeeding advertisements we shall go behind our record of performance and describe some of the means we use which made the record possible.

## HERCULES POWDER COMPANY

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Pottsville, Pa.  
St. Louis, Mo.

Salt Lake City, Utah  
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Wilkes-Barre, Pa.  
Wilmington, Del.





## What Industry Owes to Engineering



*After many years of service as a direct-current generator, this original application in the steel industry in 1891—in the Edgar Thompson Works of the Carnegie Steel Co., Bessemer, Pa.—ended its days as a motor in the pattern shop.*

# First in Electrification of Industry

### Where Westinghouse Blazed the Trail

Steel Industry  
Textile Manufacturing  
Paper Making  
Rubber Industry  
Material Handling  
Motion Picture Industry  
Meat Packing  
Railroading  
Ship Building  
And Others

In 1891 the first electric motor was put to work in a steel mill. In 1905 the first large rolling mill motor, and in 1906, the first reversing mill motor were also installed in steel mills. These motors—all Westinghouse Motors—were history-makers in the steel industry.

Other industries too have profited by Westinghouse engineering pioneering.

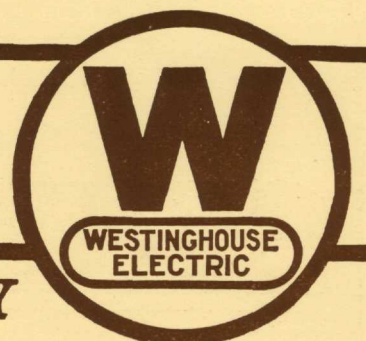
—In the textile industry, individual motor drive became a reality in 1902, in the Sauguoit Silk Co., Philadelphia, Pa.

—In the rubber industry, Westinghouse ideas as originally applied in 1900, are today the standard method of application in plants throughout the world.

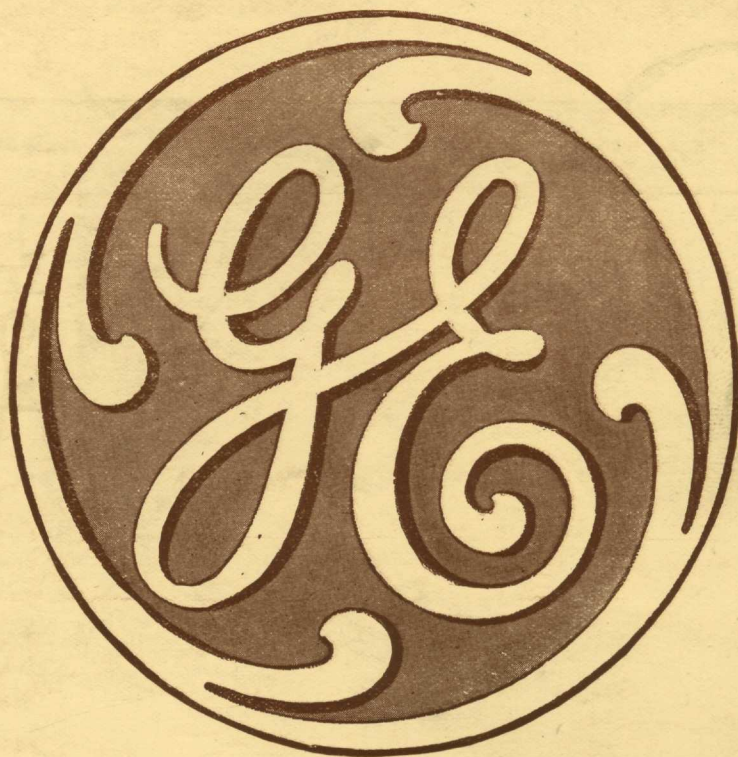
—In the handling of materials at the world's great shipping centers, in the manufacturing of paper, in the motion picture industry, in coal mining, in meat packing, railroading, ship building—in fact, in every branch of human activity can be found progress and profits traceable directly to the pioneering of Westinghouse Engineers.

# Westinghouse

## ACHIEVEMENT & OPPORTUNITY







## The initials of a friend

You will find these letters on many tools by which electricity works. They are on great generators used by electric light and power companies; and on lamps that light millions of homes.

They are on big motors that pull railway trains; and on tiny motors that make hard housework easy.

By such tools electricity dispels the dark and lifts heavy burdens from human shoulders. Hence the letters G-E are more than a trademark. They are an emblem of service—the initials of a friend.

95-690HD  
**GENERAL ELECTRIC**

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